

REMARKS

Claims 1 and 2 are pending. In the Amendment filed on October 10, 2001, counsel inadvertently presented the unamended version of claims 1 and 2 as amended. Actually, counsel intended to amend only claim 2 (to correct the improper Markush group in claim 2 as filed and the inconsistency related to "alloy element" in claim 2). In this response, the amendment to claim 2 originally intended is presented. The amendment is editorial and would not narrow the scope of the amended recitation.

Rejection under 35 USC §112

Claim 2 was rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and claim the subject matter which the applicant regards as the invention. Specifically in Claim 2, the limitation "wherein the alloy element of the platinum alloy is any of ruthenium...or manganese." The Examiner objects to the language "any of".

Claim 2 has been amended above to form a proper Markush group thereby removing the "any of" language. Given the above amendment, we hereby respectfully request that this objection be withdrawn.

Claims 1 and 2 were rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and claim the subject matter which the applicant regards as the invention. Specifically, the Examiner asserted that the language is not consistent in Claims 1 and 2.

Claim 2 has been amended to standardize the language between the claims. Given the above amendment, Applicant hereby respectfully requests that this objection be withdrawn.

Rejection under 35 USC §102

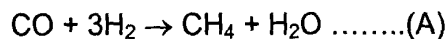
Claims 1 and 2 were rejected under 35 USC §102(b) as being anticipated by Fleming et al., US Patent No. 3,884,838 (hereinafter 'the Fleming reference'). Applicant respectfully traverses the rejection.

First, Fleming et al. discloses a catalyst composition useful for reacting carbon monoxide and/or carbon dioxide with hydrogen gas to form methane, which catalyst compositions comprises: ruthenium containing 0-50 weight percent platinum; and 5-20 weight percent reduced amorphous tungsten oxide.

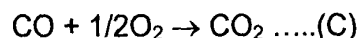
Additionally, Fleming's catalyst is added to methane, and not a selectively oxidizing catalyst for oxidizing reformed gas as in the present invention. Additionally, the catalyst in the present invention does **not** contain reduced amorphous tungsten oxide which is an essential composition to the Fleming's catalyst.

A selectively oxidizing catalyst for oxidizing reformed gas, as in the present invention, converts CO into CO₂ without oxidizing hydrogen contained in fuel gas for a fuel cell. More specifically, the present catalyst does not act to produce methane but to convert CO into CO₂ without oxidizing hydrogen contained in fuel gas for a fuel cell.

Second, Fleming's catalyst is a methanation catalyst which promotes reduction by fuel hydrogen as formulated below (A)(B).



By contrast, the present catalyst is a selectively oxidizing catalyst using externally-added O_2 , for promoting oxidizing reaction as formulated below (C).



Since in the Fleming's catalyst the methane (CH_4) produced with the use of fuel hydrogen cannot be used at all for the reaction of a fuel cell, all the hydrogen consumed for the above reactions (A) and (B) will be a loss of fuel availability. The catalyst thereby wastes a quantity of hydrogen.

The present catalyst uses a stoichiometric quantity of O_2 to selectively oxidize CO only in a reformed gas where hydrogen and CO coexist. Thus, there is no waste of hydrogen by the (A) reaction when fuel cell reaction is initiated. Further, the CO_2 originally present in the reformed gas has nothing to do with reaction.

Thus, the Applicant respectfully disagrees with the Examiner's position that the present invention is anticipated by Fleming et al. Applicant hereby respectfully requests that this rejection be withdrawn.

Rejections under 35 USC §103(a)

Claims 1 and 2 were rejected under 35 USC 103(a) as unpatentable over JP 7-256112 in view of Database of Zeolite Structures. Applicant respectfully traverses the rejection.

JP-7-256112 discloses catalyst composition comprising a metal from a group including ruthenium and platinum and a zeolite support structure. Database of Zeolite structures adds the specific name of mordenite to match the zeolite characteristics described in JP 7-256112.

In the JP7-256112 filed by the present Applicant, there is no disclosure that the zeolite carrier is mordenite, as asserted by the Office Action. Therefore, relying upon JP7-256112 only, it would have been impossible for one of ordinary skill to use mordenite in the catalyst composition of JP7-256112.

The Database of Zeolite Structures teaches mordenite has an aperture size of 0.75 nm.

Mordenite and platinum alloy have been employed as a carrier and catalyst composition, respectively, and the amount of alloy element has been set to 20-50 atomic %, and therefore efficient conversion of only CO into CO₂ without causing loss of hydrogen gas present in the reformed gas has been made possible for the first time.

No loss of hydrogen gas present in the reformed gas has been an issue to be overcome for making fuel cell vehicle into practical use.

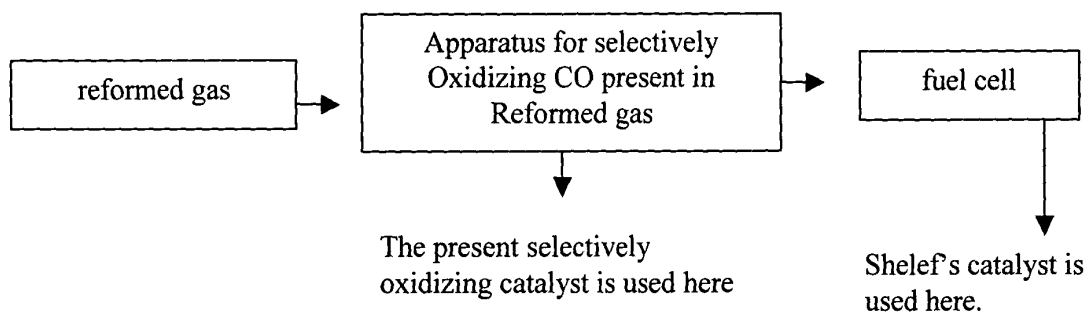
Thus, the conventional catalytic technology failed to produce a satisfactory level of catalyst. It is not reasonable to allege, as the Office Action did, that the present invention was obvious as merely a combination of conventional technologies. Applicant contends that one of ordinary skill would not have arrived at the combinations of the claimed catalyst composition with the carrier to be used with the catalyst. As indicated in the specification, the claimed invention can achieve surprising and unexpectedly better results than that produced by the prior art.

Thus, the Applicant respectfully disagrees with the Examiner's position that the claimed invention is obvious in light of JP7-256112 in light of the database of zeolite structures which did not produce results as favorable as those outlined in the present specification.

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Shelef (U.S. Patent 6,117,581). Applicant respectfully traverses the rejection.

Shelef discloses an electrode comprising a conductive zeolite support material. The catalyst present in the electrode of Shelef is a gas-decomposing catalyst for generating power in a fuel cell, which is completely different from that of the present invention both in the stage and objective. On the other hand, the present catalyst acts to remove CO in reformed gas which is still present outside an fuel cell.

The flow chart below briefly explains differences between the two processes.

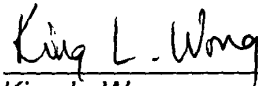


As demonstrated, the purpose and activity of the present catalyst is different from Shelef patent. It would not have been obvious to use the catalyst system of Shelef which has a different function and a different purpose. Given this demonstration, applicant respectfully requests withdrawal of the rejection.

Applicant respectfully submits that this application is in condition for allowance and such action is earnestly solicited.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,



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APPENDIX

2. (Amended) A catalyst for oxidizing a reformed gas according to claim 1, wherein the alloy metal [element] of the platinum alloy is selected from the group consisting [any] of ruthenium, iron, rhodium, cobalt, molybdenum, nickel[, or] and manganese.